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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/579,191	08/02/2006	Tadashi Komoto	2006_0721A	6698

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EXAMINER	
DYE, ROBERT C	

ART UNIT	PAPER NUMBER
1791	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/579,191	KOMOTO ET AL.	
	Examiner	Art Unit	
	ROBERT DYE	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 May 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/02/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 39 and 40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claims 39 and 40 recite the limitation "gears as claimed in claim 17" in the last line of each claim. There is insufficient antecedent basis for this limitation in the claim since claim 17 has been cancelled. For the purpose of examination claims 39 and 40 will be considered dependent on claim 28.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 21-24, 26-32 and 34-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP2002-248649 (Foreign Patent Publication and partial translation, already of record) in view JP1-310924 (Foreign Patent Publication and partial translation, already of record), further in view of JP1-69314 (Foreign Patent Publication and partial translation, already of record) and further in view of JP 7-60556 (Foreign Patent Publication and partial translation, already of record).

5. JP2002-248649 (hereinafter '649) teaches a method of manufacturing a resin-coated insert comprising a step of pre-heating mold above 40C (mold temperature: 80C, paragraph 16), a step of injection molding the resin onto the insert, and a cooling step. '649 does not explicitly state a holding step; however, such a step is considered to take place in the injection molding operation of '649 as any miniscule passage of time between injection of the resin and removal of the product would constitute a holding step.

6. Document '649 does not teach a step wherein the insert is preheated to a temperature above 40ºC. In the same field of endeavor of insert molding, JP1-310924 (hereinafter '924) teaches a method wherein the insert is preheated before insertion into the die in order to prevent peeling of the applied resin (see Table 1 and example 1 wherein insert is preheated to temperatures of 200-330ºC). Thus, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to preheat the resin as taught by '924 in the method disclosed in '649 for the benefit improving the adhesive properties of the resin to the insert (Table 1 and example 1).

7. The hypothetical combination of '649 and '924 still does not teach a step wherein the insert is removed from the die and then gradually cooled; however, in the same field of endeavor of injection molding articles, JP1-69314 (hereinafter '314) teaches a method wherein an injection molded article is slowly cooled following injection for the purpose of achieving constant shrinkage and eliminating problems of inner strain or dimensional scattering due to quenching (pg 5 of partial translation). Thus, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have slowly cooled the molded article as taught by '314 in the method of the combination '649 and '924 for the purpose of achieving constant shrinkage and reduced inner strain (pg 5).

8. The hypothetical combination of '649, '924 and '314 still does not teach a step wherein the insert material is subjected to a shot-blasting treatment and a silane coupling treatment. In the same field of endeavor of manufacturing insert parts with synthetic resin coverings, '556 teaches a method wherein a shot blast and silane-

coupling treatment are applied to the metal surface for the purpose of increasing the bonding strength between the metal insert and the synthetic resin (paragraphs 44-45). Thus, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to perform a shot blast and silane-coupling treatment as taught by '556 in the method of combination of '649, '924 and '314 for the purpose of increasing the bonding strength of the applied resin to the insert (paragraphs 44-45).

9. Regarding claim 22, wherein the steps of claim 21 are recited including the limitation that the mold is preheated to a temperature region lower than the temperature of the insert member. Techniques wherein the insert material is heated to a temperature higher than that of the die are well known and as disclosed in '924, the insert is preheated to a temperature of up to 400°C and placed in a mold of 150ºC in order to prevent peeling of the applied resin. Thus, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to preheat the insert to a temperature higher than that of the die as taught by '924 for the purpose of preventing the applied resin from peeling.

10. Regarding claim 23, '649 teaches that the insert member is a metal (iron, paragraph 16).

11. Regarding claim 24, '649 teaches that the resin is nylon 66, a thermoplastic homopolymer.

12. Regarding claims 26 and 27 wherein the molding does not generate resin cracks in air and the molding does not generate cracks or peeling in water, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to

apply the characteristic improving techniques that are disclosed in documents '924, '314 and '556 to improve the adhesiveness of the resin on the insert in order to prevent problems such as the cracking or peeling of the resin.

13. Regarding claim 28, JP2002-248649 (hereinafter '649) teaches a method of manufacturing a resin-coated metal gear comprising a step of pre-heating mold above 40°C (mold temperature: 80°C, paragraph 16), a step of injection molding the resin onto the insert, and a cooling step. '649 does not explicitly state a holding step; however, such a step would inherently take place in the injection molding operation of '649. Any miniscule passage of time between injection of the resin and removal of the product would constitute a holding step.

14. Document '649 does not teach a step wherein the insert is preheated. In the same field of endeavor of insert molding, JP1-310924 (hereinafter '924) teaches a method wherein the insert is preheated before insertion into the die in order to prevent peeling of the applied resin (see Table 1 and example 1). Thus, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to preheat the resin as taught by '924 in the method disclosed in '649 for the benefit improving the adhesive properties of the resin to the insert (Table 1 and example 1).

15. The hypothetical combination of '649 and '924 still does not teach a step wherein the insert is removed from the die and then gradually cooled; however, in the same field of endeavor of injection molding articles, JP1-69314 (hereinafter '314) teaches a method wherein an injection molded article is slowly cooled following injection for the

purpose of achieving constant shrinkage and eliminating problems of inner strain or dimensional scattering due to quenching (pg 5 of partial translation). Thus, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have slowly cooled the molded article as taught by '314 in the method of the combination '649 and '924 for the purpose of achieving constant shrinkage and reduced inner strain (pg 5).

16. The hypothetical combination of '649, '924 and '314 still does not teach a step wherein the insert material is subjected to a shot-blasting treatment and a silane coupling treatment. In the same field of endeavor of manufacturing insert parts with synthetic resin coverings, '556 teaches a method wherein a shot blast and silane-coupling treatment are applied to the metal surface for the purpose of increasing the bonding strength between the metal insert and the synthetic resin (paragraphs 44-45). Thus, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to perform a shot blast and silane-coupling treatment as taught by '556 in the method of combination of '649, '924 and '314 for the purpose of increasing the bonding strength of the applied resin to the insert (paragraphs 44-45).

17. Regarding claim 29, wherein the steps of claim 28 are recited including the limitation that the mold is preheated to a temperature region lower than the temperature of the insert member. Techniques wherein the insert material is heated to a temperature higher than that of the die are well known and as disclosed in '924, the insert is preheated to a temperature of up to 400°C and placed in a mold of 150°C in order to prevent peeling of the applied resin. Thus, it would have been obvious to a person

having ordinary skill in the art at the time the invention was made to preheat the insert to a temperature higher than that of the die as taught by '924 for the purpose of preventing the applied resin from peeling.

18. Regarding claim 30, '649 teaches the method for making an insert-containing resin gear such as a worm wheel (paragraph 1). Such a wheel is used for transmitting power.

19. Regarding claim 31, '649 teaches that the gear is made of iron (paragraph 16).

20. Regarding claim 32, '649 teaches that the resin is nylon 66, a thermoplastic homopolymer.

21. Regarding claim 34, wherein the resin-coated metal gears have suppressed resin crack and resin peeling, the examiner notes that the steps taught and discussed above would result in such properties.

22. Regarding claims 35 and 36, the matter of whether the gears that have been coated with a resin intermesh with gears that have been coated with a resin or not is merely one of design and as such can be configured in an appropriate matter by a person having ordinary skill in the art.

23. Regarding claims 37 and 38, wherein the resin-coated metal gears obtained by the method of claim 28 have impact resistance and fatigue resistance superior to that of a resin-made gear, the cited combination of prior art teaches the method of claim 28 as described above and the properties of increased impact and fatigue resistance would be expected to be inherent as a result of applying a resin coating to a metal gear in a manner as described in the claimed method.

24. Claims 25 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP2002-248649 (partial translation, already of record) in view of JP1-310924 (partial translation, already of record), JP1-69314 (partial translation, already of record), JP 7-60556 (partial translation, already of record) as applied to claims 21 and 28 above, and further in view of Kitahata et al. (PG Pub 2003/0013475).

25. The previously stated combination of '649, '924 '314, and '556 teaches a method of making a resin-coated insert as described above for claim 21 and a resin coated gear as described above for claim 28, but does not teach that a method wherein the resin applied to the surface of the insert member has a thickness in a range of 5μm to 30mm. In the same field of endeavor or making resin coated articles, Kitahata et al. (hereinafter Kitahata) teaches a resin coated gear wherein the thin resin layer has a thickness set between 100um to 250um for the purpose of achieving reduced working noise and wear (paragraph 35). It would have been an obvious for a person having ordinary skill in the art at the time the invention was made to use the thickness as taught by Kitahata in the aforementioned combination for the purpose of ensuring a sufficiently thick coating on the surface of the gears to achieve noise and wear reduction (paragraph 35).

26. Claims 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arpin (USP 3,180,171) in view of JP7-60556 (partial translation, already of record).

27. Claims 39 and 40 are recognized as product-by-process claims. Even though product-by-process claims are limited by and defined by the process, determination of

patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process (See MPEP 2113).

28. Regarding claim 39, Arpin discloses "thermoplastic resin covered metal gears which are characterized by excellent adhesion of the thermoplastic resin coating to the metal gear blank" (col 1, line 61-63) and further teaches that said resin coating is molded onto the metal gear in a molding operation (col 1, line 54-60). Regarding the lubricating and wear resistance properties of claim 39 and the noise reducing properties of claim 40, Arpin teaches that the resin covered gears have the advantages of having the strength of metal gears as well as the good bearing qualities, quietness, toughness and other desirable properties of plastic gears (col 1, lines 14-18). Regarding the silane-coupling and hot blast treatment steps, Arpin teaches that a suitable gear blank surface may be produced by the selective etching or other treatment of the gear blanks (col 2, lines 20-21) but does not teach a silane coupling and hot blast treatment step. In the same field of endeavor of resin coated gears, '556 teaches metal gears wherein silane-coupling and hot blast treatments have been applied in order to increase the bonding strength between the gear blank and the synthetic resin portion (paragraphs 44-45). Thus it would have been obvious to a person having ordinary skill in the art at the time of the invention to include a silane coupling and hot blast treatment step as taught by '556 to produce the resin-coated gears of Arpin for the purpose of increasing the adhesion of the resin to the gear.

29. Regarding claim 40, Arpin discloses "thermoplastic resin covered metal gears which are characterized by excellent adhesion of the thermoplastic resin coating to the metal gear blank" (col 1, line 61-63) and further teaches that said resin coating is molded onto the metal gear in a molding operation (col 1, line 54-60). Regarding the noise reducing properties of claim 40, Arpin teaches that the resin covered gears have the advantages of having the strength of metal gears as well as the good bearing qualities, quietness, toughness and other desirable properties of plastic gears (col 1, lines 14-18). Regarding the silane coupling and hot blast treatment steps, Arpin teaches that a suitable gear blank surface may be produced by the selective etching or other treatment of the gear blanks (col 2, lines 20-21) but does not teach a silane coupling and hot blast treatment step. In the same field of endeavor of resin coated gears, '556 teaches metal gears wherein silane-coupling and hot blast treatments have been applied in order to increase the bonding strength between the gear blank and the synthetic resin portion (paragraphs 44-45). Thus it would have been obvious to a person having ordinary skill in the art at the time of the invention to include a silane coupling and hot blast treatment step as taught by '556 to produce the resin-coated gears of Arpin for the purpose of increasing the adhesion of the resin to the gear.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT DYE whose telephone number is (571)270-

7059. The examiner can normally be reached on Monday to Friday 8:00AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Del Sole can be reached on (571)272-1130. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. D./

/Joseph S. Del Sole/
Supervisory Patent Examiner, Art Unit 4152